

R&S®Pulse Sequencer Software RF Release Notes

Software Version 2.6

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The software makes use of several valuable open source software packages. For information, see the "Open Source Acknowledgment" provided with the product.

The following abbreviations are used throughout this document: R&S®Pulse Sequencer Software is abbreviated as R&SPulse Sequencer Software

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1 Information on current version & history

1.1 Version 2.6

Released: June 2023

New functionality

Functions

Refactored the project tree view. List based overview of elements is now available.

Improved general look and feel

Switched to R&S icon theme. Changed application font

Switched to R&S CI light color scheme. Removed all others.

Reorganized file menu actions

Moved virtual screens to tabs

Improved scenario creation selection dialog

Enabled auto save per default

Nominal gain of antenna patterns is now displayed in the receiver dialogs

Added position and attitude parameters to PDW reporting

Improved repository tree speed for many items. Added configurable upper limit for items.

Added support of new R&S WINIQSIM Waveforms:

K149/ K449 UWB HPR (SMW/ SMBV/ Win-IQSIM2)

K147/ K447 WLAN 802.11be (SMW/ SMBV/ Win-IQSIM2)

K170/ K470 5G NR Sidelink (SMW/ SMBV/ Win-IQSIM2)

K171/ K471 5G NR R17 (SMW/ SMBV/ SGT/ Win-IQSIM2)

K169/ K469 DVB RCS2 (SMW/ Win-IQSIM2)

K176/ K476 DVB S2X Annex E (SMW/ Win-IQSIM2)

K123/ K423 Modern-ized GLO-NASS (SMW/ SMBV/ Win-IQSIM2)

K177/K477 WLAN IEEE 802.11ay (SMW/Win-IQSIM2)

Improvements

Improvements

Fixed potential deadlock in 3D preview of direction-finding scenarios

Increased Visa read buffer to prevent error messages from SCPI queries for reading the generators file and directory structure. If the file structure in a folder exceeded 32000 characters, an error was raised.

Fixed crash if a repository was locked and a new generator or destination was added

Scenario:trigger SCPI did not raise an error if the SW was not started with separate trigger setting

B1044N option was not supported for SMM100A device type

Compatibility indicator was missing for some RFPAL setups in table

Detection of RFPAL setups on a generator had no progress bar and took too long

RFPAL import log messages where not really useful

Fixed layout issues in RFPAL import table

Threshold in calculation settings was used as dynamic range from 0dB, not as absolute threshold value

Fixed bug where custom scan table transition time edit state was not updated accordingly

Known issues

Known Issues

It is recommended to do a per-machine installation. Per-user installations could potentially lead to instabilities in combination with the R&S License Server.

1.2 Version 2.5

Released: November 2022

New functionality

Functions

Added integration for SMW-K525 RF Ports Alignment. Signal boundaries regarding frequency and level are checked against calibration setup.

Added new DF receiver mode. Combination of interferometer for phase and TDOA for time delay.

Allow definition of variable sinks for IPM profiles that then can be used in subsequent IPM definitions. A main use case is to use the same IPM value for multiple parameters.

A troubleshooting button was added in the scenario dialog which directly jumps to the problem reported in the error messages

Signal statistics such as bandwidth and center frequencies are now available from the results pop-up menus in the block diagram

Added CW signal support for PDWs if PRI equals pulse width. No more glitches due to rounding errors

Added "truncation" option in ARB calculation mode

Improved table navigation/editing with keyboard

Fixed table editing issues e.g. losing focus on cell after adding row

Added individual current distributions for phased arrays in X and Z direction

Improved FFT widget in modulation preview. Default oversampling and I/Q sample size was suboptimal

Added configurable oversampling and FFT settings in modulation preview

Enhanced modulation spectrum preview by selectable consideration of the pulse envelope

Signal duration is now shown in scenario dialog after evaluation stage in auto mode

Items on map that are assigned to a signal generator are now marked

Icon size on Map is now configurable (small/big)

Improved assignment dialog drag and drop behavior

Added autosave setting

Added check of remaining signal generator HDD storage before uploading waveforms

Enhanced connector finding help. Jump to every generator type now directly possible from main menu

Show K-Options encryption keys in PDW viewer

Show K-Options encryption keys in waveform viewer

Show K-Option encryption keys for imported waveforms in waveform dialog

Add "copy & append" button for PDW List and Emitter Collection scenario tables

Add "copy & append" button for Sequence Collection scenario table

Improved sequence creation via SCPI commands by 1000%

Added warning in scenario dialog for empty PDW files

Added warning in scenario dialog for empty imported I/Q files

Improvements

Improvements

R&S SGT100A support was broken in previous version because of an unsupported SCPI command

Fixed sporadic crash when activating an MDI window

Fixed crash if the software was closed with the assignment dialog still open

Prevent race condition upon storage clear action. Could result in misleading error messages

Progress preview was not restored when minimizing the main window and restoring it later

Fixed Barker Code PDW generation. Some pulse widths created broken PDWs

Split Workspace Save location between PS variants

Progress was missing in processing of imported waveforms during calculation

SCPI assignment of signals onto virtual generators via SCEN:GEN did not work

Fixed SCPI STAT:OPER:COND? flag for issuing separate trigger command. Completion of the command was not communicated via SCPI query.

Scaling of DF receiver and platform 3D previews was not optimal

Fixed SCPI recorder trace for signal assignments

Fixed PDW import double precision error

Fixed waveform viewer zoom cursor placement upon mouse click

Remove action from sequence editor block diagram was not working anymore

When switching from target Generator to target File the assignment was not reset. Dialog did not show the previously assigned items any more

Set path action for setting the target directory from the block diagram was not working

When adding a new sequence in the sequence collection scenario the first sequence type in the repository is preselected automatically instead of selecting NONE

Fixed FFT preview y-axis labels. Labels were not shown in pulse modulation preview

Added info messages during startup splash screen

Creation of a new scenario took always the first signal generator as a default device without checking if this generator was virtual. That could lead to misleading error messages since the online state of a virtual generator was checked which subsequently failed

Emitter frequencies were limited to 44GHz instead of the maximum of 72GHz by our signal generators

Fixed EOF in PDW import if PRI parameter was set. EOF was always last TOA + last pulse width

Default vehicle file is loaded to avoid calculation errors if smoothing is enabled but no file is selected

Lon/Lat/Altitude georeferenced positions were invalid if emitter had no movement but a static position

Usage of background signals did lead to crash in 2.4 release

Known issues

Known Issues

It is recommended to do a per-machine installation. Per-user installations could potentially lead to instabilities in combination with the R&S License Server.

1.3 Version 2.4

Released: June 2022

New functionality

Functions

Rebuild Mode Editor for better usability. Fixed several bugs as well.

Added custom icon import

Crash Dumps are added to the debugging information export

Added Support for SMW-B9F baseband coder option

Improved imported waveform resampling times by 100%

Improved calculation speed of all data source dependent MOPs by 100%

Added RF unmute button in generators dashboard

Added global mute and unmute button in scenario dialog

Added search alias and interleaving options for PDW List scenario interleaving dialog

Added search alias and editing options for PDW List scenario dialog

Added checkbox to select whether the live position preview will be displayed

Added time controls for 2D movement preview (slower/faster)

Changed Emitter Modes and Beams configuration to table view

Added reordering and copy & paste functionality for sequence editor dialog

Added copy functionality for modes and beams

Emitter beams have alias names now instead of numbers

Added keyboard shortcut for creating platforms

Increased 3D model loading times by 100%

Show progress for multi gen uploads

Removed example generators from example repositories

Improvements

Improvements

SMM100A signal generator was not supported

PDW conversion created old R&S SMW200A PDW format in PDW List collection scenario type. Signals could not be played back on newest firmware.

Interleaving bandwidth was limited to 200MHz

Fixed sporadic drops of continuous pulses when interleaving due to sample offsets

When OpenGL windows overlapped with dialogs that contained tables, the GUI would sometimes freeze

Fixed potential crash in multithreaded movement calculations in DF scenarios

Fixed GUI freeze if reconnecting to a remote desktop session

Removed unnecessary and time-consuming GL updates on remote desktop operation

Direction finding mode was not supported in K315 system config with Pulse Sequencer Software

Incomplete visualization of traces in interleaving analyze viewer in case timeframe exceeds 50s

Fixed unload plugin error message

Waveform clock was set to two times the signal bandwidth instead of the necessary factor of 1.2. MOPs with a bandwidth > 1.2 GHz could not be calculated.

Fixed "None" SCPIs in Emitter Mode definitions

Import of CW AMMOS pdws with CW MOP and Width = 0 caused infinite bandwidth

Fixed potential crash in generator control panel

Visualization of interleaving stats was not scaled accordingly when interleaving a large number of signals

Fixed unit issue in live position preview. Meters were displayed as kilometers

Progress Dialog remained invisible after it got closed once

Fixed SCPI error in generator control panel for single path SMWs

Fixed cursor info update in waveform viewer

Fixed 1 time tick TOA error at the end of a PDW file

Fixed height scaling for platform and DF receiver 3D previews

Known issues

Known Issues

None

1.4 Version 2.3

Released: November 2021

New functionality

Functions

Added new Option SMW-K307 to increase number of interleaved emitters per baseband to 512

Added frequency agility via means of CNTRL PDWs

Added palmer scan to spiral scan

Adapted the live interleaving preview to add scrollbars when a large number of emitters is processed

Added feature to export debugging information in the main menus "debug information" action

Interleaving group contents are now collapsible in assignment dialog

Extend RX Height parameter from 100e3 to 1e9

Added separate color group for PDW traces

Added rewind functionality for raster scan

PDW Import now supports import of waveforms in R&S vv format

Added information about interleaving priority in analyze viewer

PDW traces are now displayed sorted by their emitter priority

Implemented Auto Jump Preview in the range of the first PDW in PDW Viewer

Added Shortcut buttons in sequence dialog to directly create and append pulses and waveforms

Increased maximum simulation time from 2h to 23 days with newest SMW firmware

Linked Show Connector Dialog in Main menu bar

Calibration information of imported RFPAL setups can now be viewed

Implemented auto scale when zooming in PDW Viewer

Round time support for circular scan definition

Saving big repositories took a long time. Speed up by factor 10

Enlarged drag and drop area in assignment dialog for improved usability

Improvements

Improvements

Fixed barker Codes 4a/4b. Added 2a/b

Fixed MOP Preview. Try to display maximum number of samples for preview

Delete all action did not actually unmap the Emitters in the assignment dialog

MOP Preview Sample Rate was too low. FFT preview had low resolution

Fixed waveform viewer scaling

Fixed flickering progress dialog after calculation was actually finished

Import of SMW-RFPAL setups was not working

Changes in the generator config did not update the assignment dialog

Missing update on instrument capabilities table when removing an instrument

Added checks in PDW import to prevent overlapping pulses

Fixed PDW import bandwidth info. File did display 0 for some kinds of modulations

Update of generator firmware version was missing upon refresh of instruments

Level Offset visualization was missing in analyze viewer

UNCAL message overlapped with signal generation box in block diagram

Deleting an emitter mode was not reflected in the scenario mode definitions. Resulted in invalid modes.

Changing a platform emitter did not reset the scenario mode definitions

Visualization of DF receiver antenna directions in 2D map preview had offset

Visualization of DF receiver antenna directions in 2D preview with movements had offset

Fixed memory leak in CPU 3D live preview

Deleting Emitter Types and thus causing gaps in their IDs lead to nonfunctional type selection in the TX items dialog if already assigned to a scenario

Changing the emitter type in scenarios did not reset the mode definitions

Timeout for resetting the signal generators increased. Could lead to errors in some cases

Timeout for activating rf ports alignment on the generators increased. Could lead to errors in some cases

RFPAL configuration had wrong SCPI commands

Unpinning the mode editor set it to r/o mode. No changes where possible

Changing the platform icon via the Tx items dialog did not work

Receiver movement trajectories shadowed items on 2D map. Right click menu did not appear.

Multithreading when using more threads than cores rendered progress dialog useless

Fixed broken layouts due to high DPI scaling

Cleaned up 3D scan preview dialog GUI

Generator config info showed no data if no repository was selected

R&S SMBV100A/B and R&S SGT could have configuration errors in collection or map-based scenarios

Fixed potential crash if opening the 3D antenna pattern preview and 3D scan preview windows

Generator HW dialog was empty and had a broken GUI if no workspace or repository was selected

3D CPU visualization of track modes for emitters and platform emitters had offsets

3D CPU Scan line visualization was painted between mode changes under certain conditions

3D CPU scan line visualization was missing beam offsets

3D GPU emitter scan preview: Scan line visualization did not consider beam offsets

3D GPU preview in localized scenarios took the receiver height into account twice

3D GPU track visualization did not work

Simultaneous visualization of steady and other scans did not determine optimum common preview speed

Pulse on Pulse icon was not updated in assignment dialog

Changed default movement behavior from "cyclic" to "one way"

Fixed interpolation bug in cyclic movements. Don't interpolate the jump back from end point to start point

Doppler calculation of moving platform emitters and a moving receiver was faulty. Always a 3GHz default frequency was assumed for the platform emitters.

Fixed math problems in FSK modulation. Could cause 0 signal.

Uninitialized variable caused INF values in interleaving analyze viewer

Fixed potential timeout error when configuring the extended sequencer after a reboot for the first time

Tooltips for PDW parameters were missing in PDW viewer

IDs were missing for PDW list collection scenario in PDW viewer

Analyze Viewer did not work for imported PDW lists

Higher priority PDWs potentially dropped due to min PRI violation with prior lower priority PDW.

Known issues

Known Issues

None

1.5 Version 2.2

Released: October 2021

New functionality

Functions

Improved the software startup time by 300%

Progress dialog is now movable and resizable

Added proxy settings for networks using proxy servers

Refactored the upper toolbars actions, buttons and icons

Antenna patterns have a customizable resolution in CPU mode now

Improved discovery times of the repository manager dialog by 1000%

Adapted software to new R&S CI. Changed default color scheme, application icons and splash screens

Added support for SMW-B1067, SMW-B1056, SMW-B1067N and SMW-B1056N RF options

Redesigned block diagram workflow and GUI

Redesigned scenario dialogs for improved usability

Added plugin variables preview table in plugin dialog

Added a functionality to define override markers to identify specific emitters

Improved PDW import logic. If imported PDWs result in ARB segments, it is now checked if there are duplicates in the imported list. Duplicate pulses are no longer calculated as additional ARB segments, but reference a single common segment now, which greatly decreases file size and calculation times.

Maximum number of chips increased in PDW import for the ASK, PSK, FSK, Custom Phase and PLFM mop types from 16 to 4096.

Added R&SSMBVB100B-K525 1GHz RF bandwidth support

Added 2GB ARB RAM buffer support for faster calculation of large waveforms

Improved calculation speed for large waveforms (<1GB) by 300%

Improved calculation speed for large waveforms (>1GB) by 100%

Improvements

Improvements

Prevent potential crash when generators are synchronized when switching between repositories

The emitter type was not shown in the assignment dialog, if its alias name was the same as its type name

Progress dialog refactored. Not usable for a large number of parallel threads. Graphics where broken

Fixed 3D Vehicle visualizations in combination with map view, icons where too small

Changed Wording "Master/Slave" to "Primary/Secondary". Old SCPIs are backward compatible

Fixed window resize functionality, when not using the bottom right resize slider

Fixed missing GUI update in generator configuration dialog after changing generator model

No filtering of generators depending on setups was done. A generator that was present in multiple setups was shown as duplicate instrument

Sequence markers where disabled by default in localized an direction finding scenarios

Unsupported instruments like R&S SMU 200A, R&S SMJ 100A and R&S SMM 100A were also shown in the non DFS version of the software

If a generator in "Master" mode inside a hardware setup had no signal assigned to it, the SW crashed

Fixed maximum signal upload timeout. It was limited to 250s, which could lead to timeouts when uploading large waveform files

When exchanging a plugin by other one, all plugin tables in the corresponding dialogs where the plugin is used where not updated to new variables

Altitude parameter for line movements had wrong SCPI limits

Disabled calculate button if the volatile results are already there

Fixed potential crash when running the SW on high resolution monitors

SCPI recorder trace for creating virtual generators was missing

SCPI recorder trace for creating virtual generators was missing

SCPI command for creating virtual generators was missing

SCPI recorder trace for creating generators was displaying unnecessary commands

SCPI recorder trace for mode editor operation was displaying wrong and unnecessary commands

SCPI recorder trace for assignment operations was displaying wrong parameters

Start preview after trigger option was not working

Fixed missing SCPI remote connection status icon update

Known issues

Known Issues

None

1.6 Version 2.1

Released: November 2020

New functionality

Functions

Added electronic steering feature for Phased Array antennas. The pattern changes dynamically dependent to the steering angle of an electronic scan.

Reworked the Signal generator handling inside the Pulse Sequencer. We do not use generator profiles anymore, but instrument handling is implemented as a global pool for all repositories in the workspace. Mapping of profiles is now obsolete to ease the configuration for the user.

Multithreading granularity for direction finding scenarios changed to signal granularity and is no longer based on emitter granularity like before, which drastically reduces calculation times.

GPU powered 3D visualizations for Emitter Collection, Localized and Direction Finding scenario previews.

Added a summary report in HTML and csv to export information about all items in the repository.

Reworked 3D live preview dialogs in regards to zooming and various usability issues.

Added choice to automatically start a synchronous 2D movement preview of map based scenarios with the triggered playback of the signals.

Added combo box in Waveform viewer to switch between all calculated signals.

Enabled position steps movement feature for ARB calculation.

Added optional tutorial videos for various dialogs when opened the first time.

Extended sequencer (PDW) based chirps longer than 13ms can now be stitched together by multiple PDWs instead of ARB calculation fallback.

Added SMW high quality table mode support in generator configuration dialog.

Hamming distribution function and Hann distribution function are now available as parameters for planar phased array and custom phased array antenna models.

Improved calculation times for random IPM profiles by 400%.

Increased sector scan maximum angle to 360 degrees.

Increased raster scan rate to 0.05° to 100000°/s with a resolution of 0.01°/s.

Increased palmer scan squint angle of circular, sector and raster scan to 45 degrees.

Removing write locks from repositories is not accessible via the repository tree context menu.

When trying to process imported AMMOS PDWs with a minimum PRI violation, the PDW is now simply not generated instead of aborting the whole conversion.

When importing AMMOS PDWs with TOAs from the past, TOAs will be normalized to the first PDW.

Added note, that only for a selected platform item, mode changes are visualized.

Improvements

Improvements

Exchanged Visual Studio runtime related DLLs. Could lead to installation problems.

Fixed bug in assignment dialog. Interleaving groups were not considered as a single signal, but instead counted as many instances as their contents rendering the interleaving feature useless.

Timeout for uploading large files was not sufficient. Could lead to abort of the signal.

Fixed rounding error in PDW List scenario that could lead to abort in signal conversion.

Mode changes did not set back the following modes scan time correctly. The scan started at the current simulation time instead of its beginning.

Changed SCPI sequence for Generator configuration to prevent CW signals before the trigger.

Fixed crash when creating a new Emitters Collection scenario if an existing one was open and the emitter table view was visible.

Fixed a potential crash with mode changes in GPU visualization when changing the modes while the preview is running.

Fixed crash when changing to GPU calculation if 3D previews were still open when the settings changes were applied.

Fixed progress bar crash in pauses during mode changes.

Pop up editor for movement trace points crashed when editing a trace point.

Disabling platforms and their assigned emitters could lead to a crash in the assignment dialogs.

SCPI operation of assigning Emitters to interleaving groups was broken. Assignment was only working for the first interleaving group.

Addition of IPM profiles affecting the same parameter did not work.

IPM preview switched to an envelope mode for a large number of preview values. Only the maximum values were displayed in this mode, which could lead to the impression that the other values were missing.

Uniform white noise distribution generated numbers above the upper limit by one step size.

Generator configuration dialog had an issue when switching between a dual channel and a single path generator. Options in path B were invisible but still part of the profile.

Automatic enabling of required options when e.g. selecting the direction finding K308 option was buggy. Options could not be deselected anymore.

REceiver:ANTenna:SElect SCPI did not check for number of antenna items. Could lead to crash.

SCPI SETup:DElete could lead to crash.

SCPI SCENario:TYPE could lead to crash if used with invalid parameters

SCPIs for PDW viewer remote control could lead to crash if no valid scenario was present

Raster scan neglected time for vertical transition between scan bars.

DF Receiver height was not visualized correctly in the 3D live preview.

Scan direction in the 2D maps preview was visualized wrong for TX without movements and tracking mode.

Frequency dependent pattern where not visualized correctly in emitter mode changes using GPU calculations.

Antenna changes due to beam frequency offsets where not visualized in the emitters 3D antenna preview and in the Single emitter scenario 3D preview.

Antenna pattern changes due to beam offset frequencies where not visualized in the platform 3D preview dialog.

Beam frequency offsets where not considered in the calculation in Single Emitter scenarios.

Beam elevation offsets where not visualized in mode changes live previews.

Update Problem with gauss antennas. Pattern was not calculated correctly in GPU mode unless a switch to an antenna type different from the gauss type occurred.

Absolute Emitter level was not visualized in Emitter Collection Scenarios 3D live preview.

Antenna Pattern x Rotation was not visualized correctly in GPU 3D scan previews.

Fixed bug in Ammos PDW reporting. Reported levels had an offset.

Wizard action "Create Repository" did not work after clearing the workspace

Example scenarios in "K300-FirstSteps-PulseDemo" showed errors when calculating.

Fixed misleading error message when switching to waypoint file movement.

If a movement had a zero duration (start point equals end point), then all other movements where not visualized.

Zooming in too close in the live level previews could cause the SW to freeze.

Selection in emitter collection and sequence collection table was not shown correctly when pressing enter after a cell edit.

Fixed broken No Data Dialogs of Emitter Collection GUI when starting up.

Fixed hidden size grip when maximizing or normalizing window sizes.

Fixed missing help dialog when pressing F1 in the mode editor dialog.

SCPI recorder did not show the correct repetitions for loop sequence items.

SCPI log for mode change operations was not logging stop time of modes.

Type info's on 2D Map were only shown if alias name was different from type name.

Repository Manager failed to open via call from the startup Assistant Wizard

Several utility windows like the message log or the console window did not support multiple display support and could end up in a hidden state if the secondary screen was disconnected.

The splash screen of the Pulse Sequencers booting routine was not always shown on the main computer screen when using multiple displays.

Fixed cut off text in the main menus sub entries on first show event.

Trace highlighting in the PDW viewer was broken.

An update of the antenna bandwidth information did not update the emitter dialogs info label.

Known issues

Known Issues

None

1.7 Version 2.0

Released: Mai 2020

New functionality

Functions

Added support for SMW-K302 "Radar Platforms" to simulate emitters on a common platform

Added support for SMW-K309 "2D Map import" to simulate real life georeferenced maps

Added new trace movement based on point and click user interaction. Advanced features such as smoothing are available as well

Added reporting feature for pulse parameters using different templates

Added AOA reporting for individual pulses

Added SCPI recorder feature for recording corresponding SCPI commands from GUI interactions

Added clipping level feature to limit signal power to a certain threshold instead of aborting the calculation if the generators upper limit was violated

Mode editor can now be used as a timeline preview, several helpful info's where added

Double click in the mode editor now directly opens the emitters mode / beam configuration GUI

Reworked several GUI dialogs to improve usability and make things easier to understand

Improved calculation times with random IPM profiles by 400%

Increased maximum allowed movement speed to 6000 m/s

Added support for SMW-B144 RF option

Added support for new 1xxx SMW RF options

Added example repositories for interleaving and movements

Added opacity settings for antennas in 3D previews

Added car vehicle type and icon

Increased maximum value for poly chirp coefficients to $-1e32$ to $+1e32$

Added visualization of RAM usage for all signal generators when calculating signals

Added emitter type info's in all dialogs

Changed folder names to human readable format when uploading signals to the generator

Improvements

Improvements

Changed signal generator configuration order in order to suppress unwanted RF Signals before the final trigger

Fixed installer bundle. Last version 1.10 expected R&S Visa installation and aborted installation if not present

Level changes in single sequence scenarios required re calculation

Azimuth and elevation properties where interchanged in Custom Antenna Pattern

Fixed Example Repo "First Steps"

LO coupling did not work for multiple SGTs in master/slave mode

Copying imported waveforms from one repository to another did not work correctly

Internal pulse modulator did only work for ASCII markers (less than 64 transitions) and not for binary markers (More than 64 transitions)

Fixed missing update in DF receiver dialog. The antenna table was not updated if the dialog was open when restarting.

Update of attitude values in point to rx mode for the emitters was missing if the height of the receiver was changed

Position info on 2D Map was wrong. East and north values where confused. North value also had wrong sign and the position info was not absolute, but relative to the receiver

Fixed several OpenGL related issues when running the Pulse Sequencer on a virtual machine or via remote desktop

Fixed combo box behavior. Double click was needed to activate them

Timeout for sanitizing operation was too short which could lead to timeout errors

Settings for FTP block size transmission where empty

Lissajous scan SCPI help for frequency, phase z and Phase x was broken

Unpinned windows could not be displayed full screen

Combo box for position steps added to 2D map for visualization purposes

SCPI for IPM source type was not working. Missing limits as well

Initial selection in multi emitter dialog without having ever selected an emitter in the 2D map did not have an effect

Y labels in PDW viewer where shifted in position each 10 steps

The first PDW was not displayed in the viewer. Also the EOF PDW was shown there and looked like a normal PDW

When using setups with multiple signal generators an error message was thrown if one of them did not have a signal assigned to it

PDW import failed If a values field is present, but a mop does not need this

Rise and fall time markers did not work with multi segment waveform signal generation

Internal pulse modulator cannot be used for multi segment waveforms

Emitter scan duration was not considered in 3D movement preview scaling

Live preview zoom for single emitter scenario 3D preview was missing

Background signals where calculated individually for each DF receiver antenna causing different signals for random signals

Remaining Time estimation fixed for background emitters

Scroll Buttons for Tab Widgets where broken

Background Signals where available for interleaving causing calculation errors.

Non interleaved background signals could not be deployed on the signal generator

Progress during FTP upload was missing

Wrong phase offset applied to waveform items in sequences in DF scenarios

FTP transmissions could not be aborted by the user

Aborting a waveform upload did not reset the volatile storage resulting the SW to think, that the waveform was uploaded

SCPIs for clearing the interleaved results and query the volatile status where missing

SCPI INST:COUNT? Always returned 1, no matter how many signal generators where in the setup

Tooltips of numeric edits where not updated regarding their min and max values

Velocity units (m/s) had wrong unit preservation when entering a new value e.g. 1200 m/s => enter 2 m/s => result was 2000 m/s

Creating a new scenario with open 3D preview dialog, caused the dialog to reject updates until another scenario was selected

Repository manager discard was not working anymore

Don't close the PDW Viewer if IL Results are invalid

Changing Receiver Scan Parameters did not rescale the live preview timings accordingly

GUIs for receiver properties, DF receiver properties and emitter properties where to large. Space was always reserved for the waypoint movement page, even if it was not visible

Changing between signals and groups in PDW viewer did not rescale the preview

Auto scaling of scan times and update rates fixed in DF Receiver 3D preview

Changing the signal in the PDW viewer updated the view twice, leading to longer preview processing times

Fixed slow motion factor and preview times in 3D preview live view

Mode Change Duration was not taken into consideration in preview times and slow motion scaling

Special Case an emitter with only one mode change did not update the 3D preview mode was visualized the total time

Selection and mode / beam combo box updates did not work properly in mode editor

SCPI connection was not completely closed when closing the application which caused the program thread to remain active

Clarified error message when trying to create a profile from a connected instrument when no physical instrument was present

SCPI help for mode editor dialog was missing

Beam azimuth parameter was not visualized in 2D movement preview

Antenna pattern Z-Rotation parameter was not visualized in 2D movement preview

Working with the mode editor dialog during a running calculation could cause a crash

Known issues

Known Issues

None

1.8 Version 1.10

Released: October 2019

New functionality

Functions

Migrated the Pulse Sequencer software to 64 Bit to ease memory requirements

Added selectable interferometer and TDO modes for DF receivers

Added SMW-K545 "RF Ports Alignment" support for hardware setups

Added SMW Master/Slave trigger support for hardware setups

Added SMW LO coupling support for hardware setups

Added multithreading support in waveform generation settings for faster calculation times

Improved calculation time of scenarios with movements by 100%

Improved performance of waveform viewers by 350%

Improved all waveform based calculations by 350%

Increased interleaving calculation speed by 300%

Added RAM buffer setting for faster ARB waveform calculations without buffering to the HDD

Improved table editing. Excel like operation

Improved map GUI. Arbitrary zooming and panning is now possible

Added graphical preview for position steps on the map

Markers can now be generated from MOP plugins

Added pre pulse and post pulse markers for pulses

Added Mode-S interrogator example

Added R&S Visa installer to Pulse Sequencer installer

Changed zoom in PDW viewer to 1,2,5 steps to avoid fractional numbers

Fixed Time Zoom in PDW Viewer. Cursor jumps could happen when zooming

Added undock functionality for MDI windows to support multiple screens

Added smart menu in interleaving dialog. Disable All / Enable All / Reset time offset / Reset Prio All / Reset level offset actions are now available

Repositories are now saved prior to exporting to prevent empty or incomplete archive files

Improvements

Improvements

When using waveforms in DF scenarios, the waveform was only generated for the first antenna.

Changed PDW sync marks for viewer navigation. The previous pattern could also be present in a PDW which caused viewer errors

Fixed 3D previews with mode changes. The first preview did not visualize the first mode correctly

When using position steps, the distance related time delay is no longer taken into consideration. Otherwise a jump from a distant position to a close one, could cause PDW start times overtaking each other between steps and the signal could not be generated

Fixed manual simulation time setting for position steps. Before, each step used the manually set value. The simulation time is now divided by the number of steps

Fixed minimum PRI check based on pulse timing parameters. Previously only the pulse width was taken into account and no rise and fall times were considered

Fixed timing preview of pulse for 10/50/90 modes

MSK MOP was not working

Fixed bug in DME example repository. Reply example used interrogator sequence

Unavailable instrument paths could be selected for signal generation

Fixed zoom in waveform preview. Sometimes the mouse wheel did not trigger a zoom event

Fixed Pos1 key behavior in numeric edits. An unnecessary space character was inserted

Fixed hidden/trapped windows due to dragging them outside the visible area or by changing the size of the main window

Fixed potential crash in emitter collection scenarios. When adding a new emitter, an empty combo box entry could be selected, causing a crash

Every click inside the mode editor triggered a restart of the 3D preview

Fixed potential crash in 2D movement preview, when using the move to start and end buttons

Restricted imported waypoint trajectories to a maximum speed of 600m/s

Clear workspace action in wizard did not work

Fixed ALC configuration in the SMBV100B generator to prevent unwanted measurement pulses

Erroneous SCPI queries caused a VISA timeout, because no response was send

SCENario:CPDW|CEMit|LOCalized|DF:GROup:SElect SCPI did not work

SCPI for PDW import time normalization was missing

SEquence:ITEM:IPM:MODE SCPI help was missing

SEquence:ITEM:PULSe SCPI could lead to crash if called with wrong parameters

SCENario:LOCalized:MOVement:WAYPoint could lead to crash if called with wrong parameters

SCENario:DF:LOCation:WAYPoint:CLEar could lead to crash if called with wrong parameters

SCENario:LOCalized:LOCation:WAYPoint:CLEar could lead to crash if called with wrong params

SCENario:DF:MOVement:VFILE:CLEar could lead to crash if called with wrong parameters

SCENario:LOCalized:MOVement:VFILE:CLEar could lead to crash if called with wrong parameters

SCENario:CPDW:FREQ could lead to crash if no PDW list is created

SCENario:DF:MOVement:VFILE could lead to crash if called with wrong parameters

SCENario:LOCalized:MOVement:VFILE could lead to crash if called with wrong parameters

SCENario:DF:MOVement:IMPort could lead to crash if called with wrong parameters

SCENario:LOCalized:MOVement:IMPort could lead to crash if called with wrong parameters

SCENario:DF:MOVement:WAYPoint could lead to crash if called with wrong parameters

SCENario:LOCalized:MOVement:WAYPoint could lead to crash if called with wrong parameters

SCENario:LOCalized:MOVement:CLEar could lead to crash if called with wrong parameters

SCENario:DF:MOVement:CLEar could lead to crash if called with wrong parameters

Known issues

Known Issues

None

1.9 Version 1.9

Released: May 2019

New functionality

Functions

Added support for SMW-K315 "Pulse on Pulse Simulation" option

Added frequency offset parameter in emitters collection scenario type

Added scan offset parameter in emitters collection scenario type

Custom scan was enhanced to allow individual lobe switching or time based scan traces

Custom scan definitions can now be imported from csv files

PDW import time format can now be used in un normalized mode, which disables normalizing the TOA of the first entry to 0

Emitter parameters such as distance and level are now also displayed in movement preview

Added auto place feature for emitter information labels on 2D map

Added repository export functionality in file menu

Added individual K304, K306 and K22 options in generator profile for each baseband path

Single sequence and emitter scenario GUI now marks currently selected item in drop down menu

Increased interleaving calculation speed by 400%

Fixed simulation time is now shown on map dialog in localized and DF scenarios

Added display of fixed simulation time in scenario GUI when turning on interleaving

Added SGS/SGU 40 GHz support for external RFs

Added combo box in PDW viewer to switch between all signals

Added emitter azimuth and elevation angles info on map

Added dynamic range info depending on emitter and receiver positions on map

Improved table performance. Working with large tables was slow

Improved combo box behavior in tables. Selecting a different combo box with a single click is now possible. Prior the current combo box had to be closed before selecting a different one.

Improved mapping dialog. Maximum number of possible signals added. Assignments that were not possible no longer clear all mapped signals

Added Area Zoom feature in PDW viewer

Range in PDW viewer is now based on time and not on number of PDWs

Implemented antenna scans with different antenna patterns by using mode changes feature. If two modes are adjacent to one another and use the same scan, the scan continues to run with the new antenna pattern without resetting the scan position after the mode change.

Improved live previews for long simulation times. Added slow motion factor and improved signal amplitude preview and resolution.

Added checkbox to disable recalculation of sequences when changing the carrier frequency

Fixed several GUI and layout issues

Improvements

Improvements

Addition of IPM profiles affecting the same parameter did not work

Fixed bug in HW manager. Selection was lost after creating a profile from a connected instrument

Maximum number of interleaved emitters (16) is now based on number of K306 options and no longer a scenario restriction

Fixed group selection in analyze viewer. Depending on the order of the groups the update was not working the first time the viewer was opened

Waypoint traces had an offset depending on the receivers lon/lat position

Fixed crash on Win10 where drag and drop on the 2D map could cause a crash

Fixed crash when unloading and discarding the changes on a map based scenario

Positioning parameters in emitter collection scenario type where not saved in repository

Changing level or frequency offset in collection scenarios did not invalidate volatile storage

Automatic duration setting was selectable in localized and direction finding scenarios using interleaving, causing a mismatch in real signal playtime and fixed duration used for interleaving. All pulses after the fixed value were dropped.

EOF PDW was not shown in PDW viewer and PDW table

Generator sanitize did not work anymore for emitter and PDW list collection scenario types after changing the generator assignment from a single generator to a setup in v1.8

When using mode changes, the progress manager did not display the currently calculated mode

Changing the absolute frequency parameter in PDW list collection scenarios did not trigger a recalculation of the signal

Wideband SMW and SMBVB had wrong maximum clock rate constrain in calculations. 600MHz instead of 520MHz are allowed

When switching between emitters with mode changes and different antenna patterns while the 3D preview is open, the antenna pattern where not updated

When switching between modes where different scans where used, the scan time continued to run. The scan was not reset and thus could create a jump in position

Copying receivers from one repository to another did not work

When using PDW waveforms in a sequence, where the sequence duration was smaller than the waveform caused a calculation error

When using PDW waveforms in a sequence, where the PRI was longer than the waveform caused a calculation error

Added check for extended sequencing option in generator profile when using interleaving to prevent a calculation error

Fixed mapping error in interleaving mode. If a signal was removed from a group and was mapped to a different RF, the upload of the signal failed

Analyze viewer did not display the different groups correctly when using the combo box to switch between them, if they were not mapped in the order they were created

Fixed bug in sequence collection scenarios if no generator profile was selected. SW gives a hint now. When creating a scenario, a generator profile is assigned per default

Fixed 3D previews of DF receivers. Live amplitude display did not scale correctly by taking relative antenna positions into account

3D visualization did not take receiver height into account when scaling the preview

Calculation of overlays of imported waveforms caused an error if the overlay was smaller than the waveform length. Clock rate could not be determined

In workspaces with multiple scenarios with moving emitters, the movement trace preview did not update correctly directly after a software restart

Adding emitters to the 2D map in write protected scenarios could cause a crash

Executing a rollback repository command could cause a crash

PDW viewer did not display the duration of an ARB based PDW

Progress bars did not display a 100% value

Fixed bug when working with separate trigger command mode. Changing between single and continuous mode cleared the volatile storage. A recalculation was required.

Fixed bug when working with separate trigger command mode. Changing between single and continuous mode cleared did not change the trigger mode in the generator when pressing the trigger button.

Fixed bug in scenario GUI where calculation info's were no longer displayed (e.g. fallback from extended sequencing to ARB waveform due to violations)

Fixed bug when calculating the level of interferer signals. Map position was not taken into account

Fixed bug in wizard. Creating a new repository did not work

Fixed GUI bug on 2D map. When changing the emitter position via mouse drag, the mouse focus was sometimes lost, causing the drag operation to abort

Removed all dock widgets. Close operations on detached windows did no longer work

Fixed spectrogram preview in waveform viewer. Window resize did not clear the FFT data

Fixed 'insert before' and 'insert after' table operations. Index shift caused insertion at wrong pos.

Fixed potential crash when reloading a repository from mass storage.

Added error message when applying positive level offsets in PDW based calculations. Fallback to ARB waveform

Fixed bug in analyze viewer. If interleaving groups were not calculated in ascending order, the viewer did not show the results when first opening it.

ARB calculation did not take the correct time for antenna scans when calculating mode changes

MSWV calculation did not take the correct time for antenna scans when calculating mode changes

All map based scenarios did not work with MSW calculation mode. Wrong free space attenuation was assumed.

Fixed Direction finding calculations. Frequency hops are taken into consideration.

Fixed background signal level for DF scenarios. Level was only correct for the first antenna.

Fixed crash when displaying long trajectories in movement scenarios

Known issues

Known Issues

None

1.10 Version 1.8

Released: February 2019

New functionality

Functions

Added R&S SMW-K306 (Multiple Emitters) support for localized emitters scenario type

Added R&S SMW-K306 (Multiple Emitters) support for direction finding scenario type

Added R&S SMW-K306 (Multiple Emitters) grouping feature. Group based interleaving possible.

Added multiple instrument support (assignment) for PDW list collection scenario type

Added multiple instrument support (assignment) for emitters collection scenario type

Increased calculation speed for PDW based signals by 60%

Increased calculation speed for ARB based signals by 100%

Improved the interleaving analyze viewer. Display of a large number of pulses was very slow

Improved the interleaving analyze viewer. As many traces as there are interleaved items can be analyzed at the same time now

Improved PDW viewer performance for large number of PDWs

Added buttons for expand / collapse tree operations

Increased waveform viewer performance by 300% (preview calculation times)

Improved the interleaving analyze viewer to display very large PDW files

Added individual frequency and absolute level values for PDW list collection entries

Added individual absolute level settings for emitter collection entries

Sequence collection GUI adapted to other collection types

Improvements

Improvements

Fixed bug where the level offset in the interleaving parameters was added twice

Fixed bug in interleaving algorithm. Under certain conditions, not all PDWs of the source file were read. Interleaving stopped earlier than the end of the file.

Fixed option display for K304/K306. Option string was displayed only once in baseband options.

Fixed bug where DF calculation results could no longer be saved in the repository storage

Interleaving threshold did not work. Calculation was not looking at total level but only on offset

Fixed bug where toggling of the interleaving checkbox caused the source data to become invalid and had to be recalculated again

Fixed bug where temporary calculation results were not deleted when changing the calculation mode from extended sequencer to ARB. Preview viewer was still displaying the PDW file

Bandwidth checks were performed on the generator clock rate instead of its bandwidth. Signals with too high bandwidth could be calculated without error message, causing aliasing

Pulse modulator was not activated in a slave SMW when a narrowband device used a wideband device as an external RF

Fixed wiring diagram for setups where a narrowband SMW used a wideband SMW as external RF

Fixed bug in DF scenarios using random IPM profiles. Random numbers were generated individually for each emitter/receiver antenna pair. Numbers are now generated once per emitter

Fixed bug in waveform viewer. Zooming out could result in a small negative start time causing an error message

Fixed bug when using scans on receiver antennas. Not the id of the scan was saved as scan, but the antenna id instead

Fixed bug in 2D preview of a receiver with scans. Antenna orientation was not visualized. All scans started at 0 deg azimuth

Fixed Receiver 3D preview flickering in window.

Fixed Zoom in PDW viewer. Zooming in on the cursor position was not working properly

Fixed Zoom in Mode Editor. Zooming in on the cursor position was not working properly

Fixed Receiver antenna pointing direction in combination with movements. All antennas pointed in the direction of the movement

Fixed bug in direction finding scenario type. The scenario was recalculated every time. Even if nothing had been changed.

Fixed simulation time in emitters collection scenario type. If no signal was present at, or after the end of the configured simulation time, the signal stopped after the last PDW. This resulted in a shorter play time

Fixed missing EOF PDW in emitters collection scenario type. If a signal was present at or after the end of the configured simulation time, the EOF PDW was not generated. Therefore the trigger mode "Auto" on the R&S SMW200A was not working, since the signal was only played once

Fixed bug in gauss antenna calculation. Resolution of CPU and GPU calculations varied, resulting in slightly different patterns

Fixed bug where collection variables in sequence collection scenarios did not work

Fixed GUI bug, where IPM profiles based on variables were not selectable unless a IPM profile was created in the repository

Fixed bug where map GUI showed no data when creating 2D scenarios using SCPI commands

The calculation could not be stopped while interleaving pulses with waveform snippets

Gauss antennas created by using the wizard had wrong HPBW

Fixed SCPI command for removing receiver antennas. Index based and not name based

Fixed bug where it was possible to configure user defined clock rates in extended sequencing output via SCPI. This can lead to corrupted signals

Fixed bug, where the selection did not change when directly clicking emitters on the map

Fixed selection bug in 2D map. Emitters behind a movement trace could no longer be edited using the context menu

Fixed bug in mode editor viewer. Maximum number of modes was limited to 16 instead of 256

Fixed display in mode editor when configuring a large number of emitters. Scrollbars added

Fixed mode editor zoom logic

Fixed insertion of new modes in the mode editor. New modes have a default duration that is dependent on the current zoom factor to make them easier to select and modify

Fixed bug when importing position steps in DF scenarios from a text file. Only the first distance value was imported

Fixed bug for generator play mode in DF scenario type. When switching between continuous and single shot the generator was not updated

Fixed visualization bug a direction finding scenario. The height of the receiver was not visualized. Signal calculation was not affected

Fixed visualization bug for beam frequency offsets. Antenna pattern was not recalculated accordingly. Signal calculation was not affected.

Minimized windows were not sent to the taskbar, but closed instead

PDW table did not always display the EOF PDW at the end of the file

Fixed bug where the Pulse Sequencer always tried to disable the internal pulse modulator of the extended sequencer without checking if the K50x option is actually installed on the device

Known issues

Known Issues

None

1.11 Version 1.7

Released: September 2018

New functionality

Functions

Emitter collection scenario type now supports interleaving for simulation of multiple emitters

Interleaving is now a separate calculation step. Source signals do not need to be recalculated when changing the interleaving parameters. This provides a massive speed advantage

Reworked Emitter collection Scenario type. Added mode changes configuration

Added new PDW viewer with unlimited time resolution and multiple parameter view

Added graphical mode changes editor and viewer

Increased calculation speed for PDW based signals by 1000%

Improved interleaving statistics

Improved PDW interleaving analysis. Speed and usability improvements

Added interleaving statistics table

Added filtering options for interleaving analysis

Added a separate repository storage for interleaving results

When importing repository archives the repository is now directly opened

Added time estimate for remaining calculation time

Added R&SSMBV-100B generator support

Added drag and Drop support for importing repository archives

Added Drag & Drop support for opening waveform files

Added the Pulse Sequencer as default program for opening repository archives and R&S waveform files

Added keyboard shortcuts for most common actions

Added support of the internal pulse modulator in the R&S SMW. No more need for external cabling

Added repository export functionality via right mouse button smart menu in tree view

Added visualization of antenna HPBW in 2D movement preview

Added message when opening repositories from previous Pulse Sequencer versions. The user can decide, if he wants to update the database

Restricted mode editor time window to 7200s

Improvements

Improvements

Fixed rounding error when importing PDWs. Lead to omitting the last Pulse causing a gap between total time and real signal duration

Bandwidth and absolute frequency dependencies are now checked prior to interleaving and calculation is directly aborted when violated

Fixed sequence editor delay SCPI. Wrong item index caused limit violation

Fixed crash when calculating a background emitter in a scenario with movements

Fixed bug where the addition of emitters to a digital output caused an error

Fixed bug where the Pulse Sequencer tried to configure analog IQ outputs on external RFs connected to the digital fader outputs

Fixed wrong bandwidth calculation when importing PLFM PDWs

Added missing SCPI for removing all mode changes

Temporary interleaving Files were not removed from C:/temp after calculation

Fixed SCPI conflict for configuring the interleaving delay parameter. Renamed SCPI from SCENario:CPDW:DELay to SCENario:CPDW:LDELay

SCPI for the selection of PDW lists was missing

Interleaving GUI did not display the interleaving parameters after restart. Update problem fixed

Minimum PRI constraint with SMW-K501/2 was missing during interleaving process

Fixed wrong visualization of RX antenna pattern in 3D previews if a track scan was configured

Fixed issue where scenarios containing imported PDWs could not be deleted

Fixed bug where imported PDWs containing absolute TOA information could not be calculated

Signal generator was not automatically set to the resulting frequency after importing PDWs with absolute RF frequency

Fixed bug where the calculation of a set of DF antenna signals was aborted, if one of the antennas does not receive a signal

3D preview did not display antenna pointing correctly for DF receivers

Changing the vehicle icon caused a recalculation of the movement data

Added auto set functionality to position the emitter and receiver for movement scenarios where only one of both uses absolute Lon/Lat position values in waypoint files

Fixed crash if movement duration was set to 0s

Fixed wrong GUI limits when configuring an ARC movement via the GUI line edits and not via mouse dragging on the 2D map

Fixed wrong level calculation for background waveforms in DF scenarios

Attitude was not calculated correctly when configuring perpendicular movements

Fixed potential crash when using special characters in repository names

SCPI control for plugin variables was missing

Fixed list index error in PDW List scenario. Tree position was used instead of independent index

PDW interleaving analysis did not work if number of dropped PDWs was smaller or equal to 1

Fixed the MSEPOCH import template option. Nanoseconds were interpreted as microseconds

Fixed IPM firing order option. Should not be available with time based lists

Fixed potential crash in interleaving analysis when switching from a scenario with more entries to one with fewer

Fixed signal generation check for missing sequence assignments to multiple Modes and Beams. Only the first mode/Beam was checked

Fixed level calibration for external RFs connected via digital interfaces

Fixed calibration procedure. Did not check for analog and digital I/Q output options SMW-K16/K17/K18/K19

SCPI for configuring the antenna polarization was missing

Fixed bug, where the automatic level control of the signal generator was not correctly configured on a second baseband

Fixed bug in reporting feature. If pulses were dropped because their level was below the level threshold, they still appeared in the report with wrong TOA information

Fixed level preview in pulse dialog. Drag markers showed a 10dB offset

Fixed wrong Y axis unit in 3D live preview. Unit is dBm and not dB

Fixed table smart menus in all tables with single selection property. Removed multi select actions

Fixed SCPI command for constant attitude. SCENario:DF:MOVement:ATTitude CONStant

Fixed SOQPSK default params. Pulse could not be calculated with these settings

Fixed custom envelope envelope preview when modifying the equation

Fixed bug in multi segment waveform evaluation. Pulses with a level below the threshold were counted as segments nevertheless

Fixed bug where the second baseband of a slave device was not set to Table (Off)

Fixed bug when importing PDWs with TOA in TIME format. Milliseconds were cut.

Fixed potential crash in receiver 3D preview.

Run mode single and option use separate trigger command are now available for localized and DF scenarios as well.

Added missing check and error message when trying to calculate an empty sequence.

Added missing checks and error messages for minimum PRI violation and ARB fallback.

Fixed bug in DF scenarios with multiple instruments in master/slave mode. Wrong trigger setting was configured.

Fixed bug in setups with multiple instruments in unsynchronized mode. Not all basebands were triggered.

The pulse width of Barker codes was confused as the chip width in all viewers

Added undo functionality in 2D map when changing the emitter position.

Added zoom functionality for signal level in live previews

Corrected level offset SCPI in Emitter Collection Scenario tape with interleaving. CMEMit:LEVEL instead of CMEMit:OFFSet

Fixed bug, where the entry field for a password for encrypted repositories was hidden by the progress bar

Fixed Auto Time Setting for DF scenarios. The scan duration was not taken into consideration.

Fixed bug where it was possible to drag emitters from other repositories directly onto the 2D map of another repository without copying them into this repository

Fixed several bugs regarding changes made in the movement settings. The movement trace was reset instead of recalculated

Beam frequency offsets were not considered during calculation

Fixed bug in DF scenario where the receiver antenna was not recalculated based on the emitters frequency

Fixed various update problems in 3D previews when visualizing mode changes. Sometimes antennas, scans and positions were not updated correctly

Fixed visualization bug in 2D movement preview for static emitters. Antenna pointing was not displayed correctly

Fixed SCPI help for emitter and receiver visualization icons

Fixed bug where the internal clock rate of the signal generator was taken into consideration for bandwidth calculations and not the actual bandwidth

Fixed bug where a fixed simulation time caused calculation error in combination with mode changes. If the time truncated the mode changes

A just inserted mode was not automatically selected in the mode editor

Fixed bug in the interleaving analysis viewer. The value for visible PDWs was always off by 1. The last PDW was not visualized

PDW viewer was still displaying a PRI value when in interleaving mode, which makes no sense.

Fixed bug where the calculation for a DF scenario was aborted when one of the antennas did not receive a signal. We calculate a zero signal now

Fixed bug in 3D previews, where beam frequency offsets from mode changes were not considered in antenna pattern calculation

Fixed bug in waveform and PDW viewers. When first calculating a PDW file and then a waveform, the viewer still displayed the previously calculated PDW file

Fixed bug where all windows were initially restricted to 80% of screen size. Only after pressing the maximize button, the size could be increased to full screen

Fixed potential crash when rapidly closing windows using the lower tool bar

Fixed wrong bandwidth limit calculation for polynomial chirps. Value was 2π higher than actual needed value, causing wrong bandwidth restrictions

Fixed visualization bugs for static modes when choosing the auto time setting

Backlobe for custom antenna was not calculated in GPU mode

Fixed potential crash when discarding changes made to a repository when closing the application.

Fixed threshold value in interleaving options. No longer coupled with global threshold parameter.

Threshold value in interleaving options did not work.

MOP plugin parameters were not forwarded to reporting plugin

Known issues

Known Issues

None

1.12 Version 1.6

Released: February 2018

New functionality

Functions

Added dynamic movement profiles for emitters and receivers in combination with R&S SMW-K304

New scenario type PDW List (collection) for direct conversion of imported PDWs to extended sequencing output with R&S SMW-K501/K502

Added priority based multi emitter dropping feature for scenario type PDW List (collection) in combination with R&S SMW-K306

Added position steps feature for localized and direction finding scenarios

Added states feature where emitters can be switched on and off over time for localized and direction finding scenarios

Increased the maximum file size of imported PDWs in the PDW import wizard to 1GByte

Added track scans for moving emitters

Added piecewise linear chirp MOP profile for PDW import

Added custom phase MOP profile for PDW import

Added firing order to list-based IPM profiles

Import of AMMOS IF data streams into waveform objects

Added exponent parameter for cardioid antenna pattern

Added HPBW for azimuth and elevation direction with gaussian and sinc antenna patterns

Increased positioning limits of receiver antennas to 10^7 m

Increased number of antennas per receiver to 20

New page with storage locations in settings dialog

New smart menu with filter settings for repository tree

Added shortcuts for IPM assignment dialog

Added single trigger option also for localized and direction finding scenarios

Added 2D and 3D visualization of Mode changes over time

Reworked Wizard for easier emitter and sequence definition

Improvements

Improvements

Phase calculation in DF scenario fixed (now using reference plane through DF group origin)

Fixed generator profile bug. Wideband property was not considered in assignment dialog

Fixed bug related to HW setups. The pulse sequencer always tried to connect to all generators, even if they were not used in a scenario

Missing option check in DF scenarios allowed use of generator profiles without SMW-K301 option

Assignment dialog assumed bandwidth of the SMW-B9 option to be 160MHz instead of 2GHz, prevented the addition of 2 emitters with more than 160MHz frequency separation to the same RF

Fixed bug where a generator profile with two basebands but only one RF caused the Pulse Sequencer to not configure the second baseband

Fixed bug, where level, frequency and name of background signals could not be edited any more

Fixed bug, where emitter mode beam frequency offsets were not considered in signal calculation

Fixed bug where the antennas of the receiver were not calculated according to the received signals frequency

Fixed bug, where the attitude of emitters and the direction of antenna scans was wrong

Fixed GPU calculation bug, where pattern resolution slowed down the live preview

Fixed bug, where the generator dashboard was always scanning the connected generators when the dialog was opened once even if the dialog was closed

Fixed bug, where selecting the "use pulse modulator" option in the HW management dialog did not have an effect on the instrument configuration

Fixed SCPI help in localized scenario receiver settings dialog

Fixed bug where the relative phase mode in the sequence settings only worked, when the pulse had a frequency offset

Fixed 3D scan preview in Emitter dialog. The antenna pattern was not visualized

Fixed bug where the direction finding power level was calculated relative to the receiver origin and not to the actual antenna position

Fixed bug where the K502 output randomly generated waveform snippets, even if the pulse could be generated in real time

Fixed bug in waveform triangular IPM profile where one entry more than needed was generated

Fixed missing updates in assignment dialog when changing parameters of the generator profile

Fixed bug where adding 2 signals to one RF port did not properly configure the stream mapper of a wideband SMW

Fixed bug where omnidirectional antennas were not visualized in DF scenarios

Corrected SCPI help in DF Receiver dialog

Fixed update problem when changing the antenna or scan of an interferer

Fixed bug where the default generator profile created upon the creation of a repository could not be deleted

Fixed bug where plugins could not be used multiple times during an IPM or MOP calculation causing a constant IPM or MOP value

Fixed calculation of distance delay for DF receiver antenna positions. Negative X and Y position offsets where taken as positive numbers

Fixed bug, where the RUN button in sequence based scenarios did not update level and frequency of the generator if value is changed after initial calculation

Fixed dialog windows for high-DPI displays

Fixed shortcuts for creating a new sequence/emitter in sequence and emitters collection scenarios

Fixed bug in localized and direction finding scenarios where signals could not be restored from the repository storage

Fixed 1 sample rounding error in EOF flag for direction finding scenarios

Fixed wrong sequence end time when PDW import was PRI based

CW filler element fixed. I and Q where interchanged

Fixed SCPI help and limits in background emitters dialog

Frequency offsets in emitter beams where not considered in visualization and calculation

New emitter/sequence shortcut button did not work in collection scenarios

Fixed bug in repository storage if using multiple generators. Only data of the 1st one was saved

Known issues

Known Issues

None

1.13 Version 1.5

Released: Mai 2017

New functionality

Functions

Added real-time wideband signal generation in combination with R&S SMW-K502

Added dynamic mode changes for emitters over time in localized and direction finding scenarios

Added level calibration wizard for HW setups

Added MSK MOP profile

Added 4/8/16/32/64 FSK MOP profiles

Added 16/32/64/128/256 QAM MOP profiles

Added 8PSK MOP profile

Added pulse modulator support for R&S SGT100A

Added x axis zoom in MOP preview

Waveform generation duration settings simplified. Auto option added

Absolute receive power dependent on distance will now be visualized in live previews

Added reset option for data sources

Added import/export functionality for HW setups

Improvements

Improvements

Fixed wrong frequency scaling in pulse modulation preview

Optimized FFT preview in MOP preview

Fixed GPU calculation of imported antenna patterns

Fixed bug when switching between emitters with a different number of modes in emitter based scenario types

Fixed crash when working with 100+ data source entries

Fixed bug where no reports were created for single emitter scenarios

Fixed bug in PDW viewer SCPI time control

Changed PDW viewer resolution to ns

Fixed bug where pulse MOP frequency preview was limited to 200MHz

Fixed bug in FSK modulation where the filter was not reset with each new pulse

Fixed bug where changing the RF channel was not working after the signal was calculated

Known issues

Known Issues

None

1.14 Version 1.4

Released: September 2016

New functionality

Functions

Added PDW import feature

IPM profiles now possible for imported waveforms

Added loop variables for use in IPM profiles, enabling sequencing of sequences

Free space attenuation is now calculated for frequency offsets and not only on carrier frequency

Static antenna preview acceleration by GPU support

Added Direction Finding Support for R&S SGT-100A

Added viewer for K501 sequences

Added lying sine antenna scan type

Added custom antenna scan type

Added lissajous antenna scan type

Added binomial IPM profile

Installer now checks correct VISA driver installation

Added SCPI commands for minimizing/maximizing the Pulse Sequencer GUI

Added SCPI commands for querying the Pulse Sequencer message log

Custom Pulse Envelope now also available for K-300 option

IPM profiles can now be specified based on repetitions or time

Improvements

Improvements

Antenna pattern polar plot was not updated when selecting an omnidirectional pattern

Fixed crash when displaying 2D map via a remote desktop due to missing OpenGL support

Fixed potential crash when restoring a workspace with less repositories than the current one

Cosine characteristic for Custom Phased Array antenna was not visualized correctly

Known issues

Known Issues

None

1.15 Version 1.3

Released: March 2016

New functionality

Functions

Added real-time signal generation option in combination with R&S SMW-K501

Added SMW wideband generator profile with 2GHz baseband bandwidth

Added GPU support to speed up antenna calculations

Added piecewise linear chirps to MOP types

Changed connection and trigger scheme of multi instrument setups

Enhanced profile to instrument mapping to hardware management which allows the creation of different hardware setups with multiple instruments

Added pedestal for all phased array current distributions

Added SGS 6GHz external RF source support for SMW200A generator profiles

Added SGS/SGT 3GHz external RF source support for SMW200A generator profiles

Improvements

Improvements

Fixed spectrogram scaling error in waveform viewer

Fixed bug that prevented the use of waveforms as a background signal

Fixed bug that showed wrong connector name in the scenario block diagram

Fixed bugs in antenna polarization

Fixed update problem when modifying background waveforms

RF B was selectable in generator profiles with only a single RF

"Auto away from origin" pointing option in DF receivers was disabled when first opening the dialog

Fixed bug, that prevented to calculate background signals on more than two antennas

Known issues

Known Issues

None

1.16 Version 1.2

Released: January 2016

New functionality

Functions

Added new scenario type for direction finding applications

Added receiver models with multiple antennas and individual antenna positioning

Added multiple entities and stream mapper support. Multiple emitters on same RF with SMK-K76

Added background signals (sequences, waveforms) functionality

Added instrument control panel for status overview and remote control of instruments

Changed coordinate system for emitters and receivers to yaw, pitch, roll

Added antenna polarization

Added custom phased array antenna type with array geometry editor

Added cardioid antenna pattern

Sequence supports phase modes (absolute, continuous, memory) for frequency hopping

Frequency setting in scenario dialog allows Hz precision

Added Java Script functionality to GUI

Changed restart() API in IPM plugin

Creation of Save/Recall file can be turned off under waveform generation settings in scenario

Enabled high quality I/Q modulator mode in generator

IPM Steps used with phase return value as modulo 360 value

Added external RF support (SGT, SGS/SGU) for multiple emitters

Emitter position now supports also angular definition

Distance units format now supports also miles, nautical miles and feet

Sequence editor now supports undo/redo functionality

Repository version increased to 2. Compatibility check added.

Generator profile dialog and connection diagram now have a "Show Connector" feature

Added button for emitter properties in 2D Map dialog

Improved warning messages if sequence cannot be generated in 2D map scenario

Renamed 'Instrument Config' to 'Generator Mapping'

Added menu entry in scenario diagram for direct access to generator mapping dialog

Added menu entry in scenario diagram for direct access to reporting directory

Multi-tone waveform added to Waveform/Interferer element

It is now possible to create a generator profile directly from the generator mapping dialog

GUI now scales automatically, when changing the DPI size of the text in the OS settings

Added SCPI command for sanitize

Phased array elements can have an omnidirectional or dipole characteristic

Loop sequence item can now define a variable which can be used for marker generation

Improvements

Improvements

Fixed problems with baseband filter in MOP

Copying sequence to other repository did not copy waveforms used as sequence items

Fixed bug in OQPSK modulation

Phase was not correctly shown in degrees in waveform viewer window

Static phase offset was not correctly applied in pulse modulation

Wrong SCPI help for roll off filter parameter

It was possible to remove all modes and beams of an emitter using SCPI commands

When renaming a tree element, the item was named "Rename" by default when the field was empty

Editing the repetition count in a sequence also affected other sequences

Removing all emitter items in localized scenarios was performed without user confirmation

Interferers could not be set correctly in Multi-Emitter scenario after order was changed in tree

Bit length of data source was not correctly evaluated

Minimum PRI was not correctly applied in first sequence line

First symbol in BPSK had wrong duration

Data sources were reset for each repetition round within a sequence

Long SCPI commands were truncated when copied using SCPI help copy functionality

Fixed bug in FSK modulation

EIRP modification using mouse wheel was not working properly

Emitter Frequency resolution was limited to 3 digits only

Fixed Bug in AM step modulation. Positive level values were clipped to 0

It was possible to drag and drop any tree element item onto the 2D map

Markers were missing when importing a waveform

Known issues

Known Issues

None

1.17 Version 1.1

Released: April 2015

New functionality

Functions

Log is brought to desktop if it was located outside of the visible desktop area and an error occurs

Emitter EIRP GUI parameter changed from dBm to dBW

Value range in IPM U-Distribution increased because 1000 was not enough for frequency offsets

2D Dialog: The distance of emitters can now be set from the GUI

Optimized I/Q waveform generation if level was reduced due to antenna influence (RF generator level decreased accordingly)

TX/RX buffer size can now be set by the user (instrument upload/download)

Added FTP upload and new GUI settings for FTP upload

Modified LAN search to work with direct links PC <-> Instrument (no DNS in network)

Partially defined antenna pattern import now possible

Sequence block diagram is interactive. Features direct access to items as well as context menus

Pulse timing is now visualized in plot

Marker positions are now visualized in plot

Measurement line now shows delta units on y axis

Waveform viewer now also shows frequency at cursor position

New installer based on Windows Installer fixes issues with Windows UAC and 64-bit systems

New version numbering scheme <Major>.<Minor>.<DaysSince2000>.<SecondsSinceMidnight/10>

Support added for FEKO .ffe V3 file formats and Antenna Magnus .tsv files

Added FEKO example project with helix on plane to installer

Network scan in "ZeroConf" networks improved (host resolution omitted)

Added ArrayCalc MATLAB example to installer (for use with free ArrayCalc toolbox)

Creating a new repository from GUI also creates one SMW200 default generator profile

Antenna pattern path is now memorized in import dialog

Import from Ansys HFSS .ffd multi-frequency far field pattern files (only first frequency imported)

Added optimized resampling algorithm for pulse based signals

Added generic import wizard for CSV-based antenna patterns (Magnus, HFSS)

Emitter-based scenarios use antenna scan duration as default when created with an emitter

Creating data source from MOP also assigns the new data source automatically

Improvements

Improvements

Pulses/waves did not compute correctly if sequence was run more than 1 times (emitter scenarios)

Receiver elevation was not visible in dialog because of false scroll bar configuration

First pulse was missing in emitter sequence if 10/50/90 ramping was used

The minimum permissible PRI was wrong with 10/50/90 timing

Due to a rounding problem waveform could be too long by one PRI cycle

Sequence marker and scenario marker could not be controlled independently

Level circles in polar antenna plot were off by 1 dB

Pulse ripple frequency was not evaluated in min. required clock rate

Fixed SGT profile capabilities error. Memory and bandwidth options where not recognized

IPM List Preview auto scale error

Sequence editor crashed when deleting loops with children

SMBV-B50 and SMBV B55 options where not recognized

3D visualization antenna update filter activated to prevent multiple updates

Level and Frequency were not applied if volatile storage was already valid

False antenna 2D plot at phase angle zero

Corrected phased array calculations with $N_x, N_z = 2$ and \cos^N or triangular current distribution

Waveform viewer 'auto play' did not stop if window was minimized

Switching a repository from K301->K300 possible even if advanced features were already used

Fixed update problem in instrument capabilities

Fixed bugs in imported antenna pattern files (also changed the file format)

Fixed wrong timing and zoom issue in 3D emitter plots

Fixed und updated 3D pair view item selection for older GPUs

Fixed line representation in 3D previews for older GPUs

Waveform sequence scenario type had disabled frequency and ref level line edits

Fixed update bug, when deleting a user imported antenna pattern

Fixed crash when issuing a reset via SCPI while 3D scan or live previews are open

Fixed crash in 2D map, when moving emitters outside visible map

Not supported instruments where shown in table for connected instruments

MOP 'Width' restriction was not correct when used with 0/100 pulse definitions

Fixed potential crash during antenna pattern import when index was out of bounds

Application crashed if repository gets unloaded while the 3D preview is open

Back lobe antenna type was constant instead of mirrored in some calculations

Fixed bug in sequence block diagram, which leads to quickly disappearing tooltips

Fixed problem with profile generation from a connected instrument. The generator type combo box disappeared for all other profiles.

When changing the name of a tree element, it was no longer selected, causing wrong SCPI help.

Fixed bug in waveform generation. Last sample was always missing.

Fixed potential crash in sequence editor

All collections did not keep their item order on subsequent load from storage

Data source dialog was not properly set to invalid when data source got removed

BPSK MOP with automatic symbol rate did not work in preview if no data source was assigned

Fixed bug in MOP filters. Removed redundant convolution with rectangular window

Fixed bug in rectangular pulse shaping filter

Fixed SCPI help for MOP filter parameters B*T and Roll Off

Fixed bug in OQPSK implementation

Fixed bug in DQPSK implementation

Known issues

Known Issues

None

1.18 Version 1.0

Released: January 2015

2 Modifications to the documentation

The current documentation is up-to-date.

3 Installing the Software

3.1 Uninstall a previous installation

To uninstall a previous version of the Pulse Sequencer software, click on the Windows Start button and navigate to Settings -> Control Panel -> Add or Remove Programs. Then select the previously installed version of the Pulse Sequencer to uninstall it.

3.2 Install the new software version

R&S Pulse Sequencer requires one of the following operating systems:

Windows 8 (64 Bit)

Windows 10 (64 Bit)

It is suggested to uninstall any previous version of the Pulse Sequencer software before installing the new software.

In Windows Explorer double-click the installer executable 'PS-Install 2.6.x.x.msi' and follow the instructions. Existing Pulse Sequencer installations are automatically updated. This includes example repositories provided by Rohde & Schwarz. Other user data, such as repositories or settings are not affected by the software update.

4 Customer support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz product, contact our customer support center. A team of highly qualified engineers provides support and works with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz products.

Contact information

Contact our customer support center at www.rohde-schwarz.com/support or follow this QR code:



Bild 4-1: QR code to the Rohde & Schwarz support page